

# The Rocky Mountain Center for Occupational and Environmental Health

WILLIAM N. ROM, MD, MPH, *Salt Lake City*

*The Rocky Mountain Center for Occupational and Environmental Health, established at the University of Utah in 1977, has developed innovative training programs in occupational and environmental health, and an administrative structure that may assist other universities as they develop multidisciplinary programs in the field of occupational health and safety.*

IN 1977 the Rocky Mountain Center for Occupational and Environmental Health (RMCOEH) was established at the University of Utah in Salt Lake City. The Rocky Mountain Center provides occupational and environmental health training, research, and service to the Rocky Mountain states. There were several advantages in choosing Salt Lake City as the location for such a center: (1) it had served as a focal point for occupational safety and health (Occupational Safety and Health Administration [OSHA] analytical laboratories, OSHA Health Response Team, National Institute for Occupational Safety and Health [NIOSH] analytical chemistry contract laboratory, and industrial hygiene facilities and personnel of Kennecott Minerals, American Smelting and Refining, and Radian Corporations); (2) it had the resources

of the University of Utah centrally located on one campus (Colleges of Mines, Engineering, Medicine, Nursing, Law, and so forth); and (3) the Department of Family and Community Medicine had the components of a School of Public Health (Master of Science in Community Medicine, equivalent to a Master of Public Health, and preventive medicine and public health residencies).

A NIOSH Educational Resource Center grant was awarded in 1978 and provides most of the financial support. It funds practically all of the training activities, whereas research monies are obtained from private, state, and national sources. RMCOEH is one of 12 NIOSH Educational Resource Centers.

The purpose of the Rocky Mountain Center is fourfold: (1) to reduce workplace-related disease and injury by training occupational safety and health professionals and by carrying out research to develop the pertinent scientific information from which action can be taken, (2) to work with and assist both industry and labor in identifying and defining occupational and environmental

From the Rocky Mountain Center for Occupational and Environmental Health and the Departments of Internal and Family and Community Medicine, University of Utah College of Medicine, Salt Lake City.

Supported by Grant NIOSH 1 T15 OH07141.

Reprint requests to: William N. Rom, MD, MPH, Director, Rocky Mountain Center for Occupational and Environmental Health, Bldg. 112, Salt Lake City, UT 84112.

ABBREVIATIONS USED IN TEXT

DFCM=Department of Family and Community Medicine  
 MSCM=Master of Science in Community Medicine  
 NIOSH=National Institute of Occupational Safety and Health  
 OSHA=Occupational Safety and Health Administration  
 RMCOEH=Rocky Mountain Center for Occupational and Environmental Health  
 USU=Utah State University

TABLE 1.—*Master of Science in Community Medicine (MSCM)*

	<i>Credits</i>
<b>Core Requirements:</b>	
Environmental Health Problems .....	3
Introduction to Biostatistics .....	3
Epidemiology .....	3
Health Care Organization .....	3
Social Context of Health Care Systems .....	3
Biostatistics/Study Design .....	3
MSCM Seminar .....	3
	<hr/> 21
<b>Occupational-Environmental Health Track:</b>	
Occupational Lung Disease .....	3.0
Biochemical Toxicology .....	5.0
Fundamentals of Industrial Hygiene .....	3.0
Industrial and Mining Safety .....	3.0
Interdisciplinary Seminar in Occupational Safety and Health .....	1.5
	<hr/> 15.5

health problems, (3) to develop an awareness of environmental problems through education, and (4) to develop innovative ideas for the role and training of occupational safety and health professionals to advance the specialty in academia, in the workplace and in the community.

**Training Programs: Occupational Medicine**

The occupational medicine residency/fellowship is a two-year program, established in July 1978. The residency provides didactic, research, clinical and practical training. The first year involves completion of the Master of Science in Community Medicine (MSCM), an accredited degree program. The MSCM requires 60 quarter credit hours, including core, track, thesis and elective courses. The core requires 21 course credits, the occupational-environmental health track requires 15.5 credits, and the thesis is 15 credits allowing 8.5 or more credits for electives.

Table 1 illustrates the core requirements and the occupational-environmental health track. Recommended electives include courses in air pollution, management, advanced statistical methods in epidemiology and advanced topics in occupational medicine. In addition, the residents may elect the industrial hygiene track, which provides a unique opportunity to learn industrial hygiene. The occupational medicine residents, nurses and industrial hygiene students all participate in the weekly interdisciplinary seminar in occupational safety and health.

Research during the first year includes course work that teaches the skills of writing a research grant or contract. The second year emphasizes research, with each resident designing, conducting and analyzing data from a research project (usually a field survey). The research thesis should be of publishable quality as a manuscript in a refereed journal. The residents are also strongly encouraged to write a review paper during their residency.

Clinical training includes working in an occupational medicine clinic and clinical rotations in pulmonary disease, neurology and dermatology. The Occupational Medicine Clinic, held twice weekly, is a referral resource for the Intermountain area. Workers with occupational diseases or complex exposure histories are usually seen. The residents also have a two-month clinical rotation on the pulmonary consulting service of one of the University of Utah-affiliated hospitals. Training in establishing differential diagnoses of chest disease is considered important for occupational medicine physicians. Up to two additional months may be spent in one of the pulmonary function laboratories to obtain skills in carrying out and analyzing pulmonary function tests. Dermatology clinics are taken during both years to learn how to diagnose, treat and prevent occupationally associated dermatoses.

The practical training is highlighted by a two-month preceptorship during the second year, which is divided between industry and labor. Each resident learns to appreciate their often divergent viewpoints, gains administrative skills, and is expected to investigate an extant problem during the preceptorship. Examples include Mountain Bell, Thiokol, Hercules, United States Steel-Geneva Works and Johns-Manville Corporation for industry; the AFL-CIO in Utah or Washington, DC, or the Oil, Chemical and Atomic Workers Union (OCAW) for labor, and governmental agencies, such as the

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OSHA Health Response Team, OSHA headquarters in Washington, DC, or the Utah Department of Health. Residents may also work with specific persons, such as Geno Saccomanno, MD, PhD, in Grand Junction, Colorado, who offers training in uranium miners' health and in sputum cytology.

The residents also participate in NIOSH Health Hazard Evaluations (HHE). In the HHE program, each resident carries out a plant walk-through (initial observation of the manufacturing process and control methods), subsequent medical examination of the workers, and writes the final report under faculty supervision. The residents participate in all of the field research to the extent feasible at the RMCOEH. Chest radiographs from the surveys are interpreted according to the 1980 International Labor Organization Classification of the Radiographs of the Pneumoconioses by a consensus reading of the Rocky Mountain Center's three NIOSH-certified B readers.

The residency has received preaccreditation status by the Graduate Medical Education Committee of the American Medical Association. Following completion of the program, the residents are eligible to take the occupational medicine examination of the American Board of Preventive Medicine.

Table 2 outlines the two combined training programs that are available. A four-year combined program with family practice and occupa-

tional medicine leads to dual board eligibility. The first two years are in family practice; the third year is divided, with fall and winter quarters spent in the MSCM didactic program and the summer and spring devoted to family practice; the fourth year is entirely occupational medicine. The other combined program is for internists subspecializing in pulmonary disease; it also leads to dual board eligibility. The first year is part of the regular clinical training program in pulmonary disease, and consists of a month as a primary physician in the Intermountain Respiratory Intensive Care Unit (IRICU) followed by five rotations of approximately ten weeks each in a pulmonary function laboratory, as supervisor of the IRICU, and as first consultant in each of the three university-affiliated hospitals. The second year is spent in the MSCM and the third year in research that emphasizes occupational lung disease.

The Pulmonary Disease Division has a close working relationship with the RMCOEH because many respiratory disorders may have occupational or environmental origins. The occupational lung disease course is taught by faculty of the division. Faculty in the Center may have appointments in Pulmonary Disease, and carry out research in occupational lung disease with faculty, staff and equipment of the pulmonary division. Consultation on inpatients with occupational lung disease is provided by Center faculty, and outpatient

TABLE 2.—Outline of the Two Combined Programs Available in Association With the Rocky Mountain Center

<i>Occupational Medicine</i>	<i>Occupational and Family Medicine</i>	<i>Occupational and Pulmonary Medicine</i>
PGY 1 Clinical Training Family Practice	Clinical Training Family Practice	Clinical Training Internal Medicine
PGY 2 MSCM—Occupational and Environmental Health	Family Practice	Internal Medicine
PGY 3 Occupational Medicine 2nd year—Research, Clinical, Practical  Board Eligible: Occupational Medicine	Family Practice: 3 months; MSCM-Occupational and Environ- mental Health: 6 months; Family Practice: 3 months	Internal Medicine  Board Eligible: Internal Medicine
PGY 4	Occupational Medicine 2nd year: Research, Clinical, Practical Board Eligible: Occupational Medicine and Family Practice	Clinical Pulmonary Rotations
PGY 5		MSCM-Occupational and Environmental Health
PGY 6		Occupational Medicine 2nd year: Research, Clinical, Practical Board Eligible: Occupational Medicine and Pulmonary Disease

MSCM=Master of Science in Community Medicine; PGY=postgraduate year

TABLE 3.—MSCM: Industrial Hygiene and Safety Track

<b>Required</b>	
Fundamentals of Industrial Hygiene .....	3.0
Advanced Topics in Industrial Hygiene .....	3.0
Industrial and Mining Safety .....	3.0
Industrial Toxicology .....	2.0
Interdisciplinary Seminar in Occupational Safety and Health .....	1.5
	<hr/> 12.5
<b>Electives</b>	
Noise Evaluation and Control* .....	3
Industrial Hygiene Chemistry* .....	3
Ventilation Engineering* .....	3
Field Experience in Occupational Safety and Health* .....	3
Readings in Environmental Health .....	2
Air Pollution Control Techniques .....	4
Radiation Biology .....	3
Law and Medicine .....	2
Statistical Methods in Epidemiology .....	3

MSCM=Master of Science in Community Medicine

\*Recommended

evaluations for Workers' Compensation (such as the Federal Black Lung Program) are done co-operatively.

The teaching of these medical students provides an additional focus. Occupational medicine is taught to the first year students as an integral portion of "Disease and Society," through the Department of Family and Community Medicine. Environmental and occupational lung disease is taught as part of the pulmonary organ system to second year students. Occupational history taking is emphasized during the third-year internal medicine rotations. A four- to eight-week elective is provided for senior medical students to participate in research projects, serve a subinternship with the OCAW union or work in the Health Hazard Evaluations program.

Career opportunities are legion with the government (such as NIOSH, OSHA, State Health Departments, Environmental Protection Agency), industry, organized labor, consulting firms, group medical practices and academia.

### **MSCM: Industrial Hygiene and Safety**

A graduate student with an engineering or science background may follow the MSCM's industrial hygiene and safety track (see Table 3). Industrial hygiene chemistry, ventilation engineering, and noise evaluation and control are strongly recommended. Field experience and a Master's thesis are required of each student. Employment

opportunities for a graduate with a Master's degree in industrial hygiene are available in NIOSH (estimates a 4,000 person shortage nationally), OSHA, state and local government, industry, labor and private consulting groups.

### **MSCM: Occupational and Environmental Health**

A graduate student admitted to the MSCM degree program may elect to concentrate in the occupational-environmental health track. Industrial toxicology (2 credits) is substituted for biochemical toxicology. The MSCM degree with this specialization is particularly useful for local health officers or environmental health specialists in small colleges, industry, local health departments or labor.

### **Occupational Health Nursing**

A Master of Science and Practitioner Certificate in Occupational Health Nursing are offered by the College of Nursing. The graduate curriculum includes course work in general nursing, occupational health nursing and care, research and electives. The Master's program is completed in 18 months to two years, and the practitioner program (part-time) is nine months. Didactic training and practical field experience are emphasized. An occupational health nursing component to the baccalaureate curriculum is taught. Occupational health nurses provide a key function in industries in pre-employment examinations and health screening and monitoring.

### **Safety**

As part of the RMCOEH, Utah State University (USU) in Logan, Utah, offers two Bachelor of Science programs: occupational safety and health, and public health (industrial hygiene option). The generalist program in occupational safety and health has been the most popular, with a safety component from the College of Engineering and a health component from the College of Science. Environmental and industrial toxicology is taught in all programs, and graduate (MS and PhD) training and research toxicology programs at USU complement the Center. The USU component involves participation in seminars and courses with the University of Utah Health Sciences Center, and credit transfers are easily arranged.

A Master of Science in Industrial Engineering

with a Safety Emphasis also has been developed at the University of Utah by RMCOEH.

### **Cross-Training**

The interdisciplinary occupational safety and health seminar provides an opportunity for specialists in all four areas to analyze occupational health issues. Ordinarily, a guest speaker is invited to discuss an occupational health and safety problem (for example, the Regional OSHA Administrator to discuss the investigation of a lead smelter and subsequent legal challenge, or an attorney to discuss the rights of a pregnant worker). The occupational health nursing program as well as the industrial hygiene and occupational medicine programs have many courses in the core and specialty tracks in common. Students also participate in epidemiologic field surveys together to further eliminate barriers that may exist between physicians, nurses and engineers. The interdisciplinary seminar in occupational safety and health provides the opportunity to explore and learn how the team concept functions in occupational safety and health. Approximately 25 students can be accommodated in each of the University of Utah and Utah State University components of the Center's programs.

### **Continuing Education**

Continuing education for occupational safety and health professionals is an essential function of the RMCOEH. A director for continuing education supervises the program. The Park City Environmental Health Conference is the major theme and academic conference held in March each year at Park City Ski Resort. The conference in 1979 was cosponsored by the Society for Occupational and Environmental Health, and entitled, "Health Implications of New Energy Technologies." The conference attracted international attention, and the proceedings were published. Nuclear, coal, oil shale, geothermal, solar, coal conversion technologies and energy transmission were discussed. The 1980 Park City Environmental Health Conference was entitled "Health and Exposures in the Smelter Environment," and was cosponsored by the Occupational Health Program of the Harvard School of Public Health.

Other major conferences include: (1) "Occupational Medicine for the Practicing Physician" in the fall (this conference alternates between Salt Lake City and Denver), (2) the Rocky

Mountain Occupational Safety and Health Conference held annually in the region, (3) the annual Utah Industrial Hygiene Conference in September at Snowbird, Utah and (4) an annual Conference for Occupational Health Nursing in the fall in Salt Lake City. NIOSH courses such as Occupational Respiratory Protection and Occupational Health Nursing—Basic Theory and Update, are taught annually. Courses in industrial hygiene, ventilation, safety, industrial hygiene chemistry and a board review course are planned or sponsored each year.

### **Research**

Research interests of the RMCOEH faculty and students cover the vast spectrum of occupational safety and health, but emphasis is placed on energy and mining-related problems. Examples of research include: cancer epidemiology using data from the Utah Cancer Registry (such as lung and other cancer incidence associated with exposure to smelter effluents or asbestos); immunologic impairments associated with effects of industrial exposures; effects on the reproductive system from occupational exposure; characterization of mineral fibers using electron microscopic techniques, and epidemiologic field surveys of a variety of workplace health problems (such as health status of underground coal miners and oil shale workers). In addition, occupational lung diseases (such as silicosis and allergic alveolitis) are major interests of several faculty members. Evaluation and control of occupational exposures, particularly of mine environments, are of special interest to the industrial hygiene faculty.

### **Administration**

The Center concept for occupational safety and health has evolved because the field is multidisciplinary, yet is in need of an academic base. Because few, if any, medical schools have departments in occupational and environmental health, most centers have their academic base in preventive and community medicine departments or schools of public health. RMCOEH has its academic base primarily in a Division of Occupational and Environmental Health in the Department of Family and Community Medicine (DFCM).

The Director of RMCOEH reports directly to the Vice President for Health Sciences, similar to the Deans of the Colleges of Medicine, Nursing,

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Pharmacy and Health. The nursing programs, the programs affiliated with USU, and continuing education programs are all coordinated by the RMCOEH Director. Supervision of the occupational medicine residency, industrial hygiene and safety program, and research areas is shared by the Director of RMCOEH and the Chief of the Division of Occupational and Environmental Health in DFCM. Currently, the RMCOEH Director and Division Chief are the same person. The Chief of the Division is responsible for RMCOEH faculty appointments in DFCM in the College of Medicine. An administrator reports directly to the Director of RMCOEH, and assists in planning budgets, prepar-

ing grants and contracts, fund-raising and solving the day-to-day operational problems.

Research grants and contracts are submitted through the Division of Occupational and Environmental Health or the Pulmonary Disease Division, and the appropriate departmental and college channels.

The RMCOEH is housed on one floor of a building adjacent to the University of Utah Health Sciences Center, and plans are being developed for additional research space. There are 25 full- or part-time faculty in the Center, and another 25 faculty participate to a lesser extent in the teaching and research programs.

## Corticosteroids and Chronic Active Hepatitis

THERE ARE A LOT of questions now about the use of corticosteroids for treating chronic active hepatitis, and one more or less typifies them: Why use prednisolone instead of prednisone?

Well, the biochemical reason initially put forth was that prednisone must be acted on by the liver to produce prednisolone. Prednisone alone is not active; prednisolone is the active compound. It was thought, due to a series of studies done mainly by Dr. Powell (now in Australia) that this might make a difference—that is, in patients with very severe liver disease conversion of prednisone to prednisolone might be incomplete, thereby giving them a lower dose of active steroid during the acute phase of the illness. And if, for any reason, their condition began to get better later, then the conversion might be improved, thereby increasing their own effective dose. These changes with prednisolone are minor, however.

—WILLIS C. MADDREY, MD, *Baltimore*

Extracted from *Audio-Digest Internal Medicine*, Vol. 27, No. 4, in the Audio-Digest Foundation's subscription series of tape-recorded programs. For subscription information: 1577 East Chevy Chase Drive, Glendale, CA 91206.